
Understanding Work and Rate Problems
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1. **Fill in the blank:** A car travels from A to B at an average speed of 60 miles per hour. The car returns from B to A (along the same route) at 40 miles per hour. The average speed of the car for the round trip from A to B to A will be _____.
 - (a) more than 50 miles per hour
 - (b) 50 miles per hour
 - (c) less than 50 miles per hour

Be prepared to justify your answer.

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2. A car travels from A to B at an average speed of 60 miles per hour. Suppose that the distance from A to B is 120 miles. After the car drives from A to B, how far should the car drive at 40 miles per hour for its average speed to be 50 miles per hour for the whole trip?
3. A car travels from A to B at an average speed of 60 miles per hour. Suppose that the distance from A to B is 120 miles. At what speed must the car be driven from B to A for its average speed to be 50 miles per hour? 70 miles per hour? 120 miles per hour?
4. A cyclist bikes up a hill at an average rate of 20 km/hr. The cyclist bikes down the same hill at an average rate of 60 km/hr. What is the cyclist's average speed for the entire trip?
5. In a coffee shop, they use a mixture of two types of beans to form some of their blends. One type of bean sells for \$8 per pound, while the other type sells for \$14 per pound.
- (a) For the house blend, they mix up batches of 120 pounds at a time, and sell them for \$9.50 per pound. How many pounds of each type of coffee go into the house blend?
- (b) For the breakfast blend, using the same two types of beans, the shop mixes up 120 pounds at a time and sells the blend for \$ 8.75 per pound. How many pounds of each type of coffee bean go into the breakfast blend?

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6. It takes Sam an average of 40 min to prune 1 tree. Victor takes 65 min to prune a tree on average.
- (a) The Sam-Victor Pruning Service has the contract for pruning 92 trees in Flagstaff. How long will it take them to prune all the trees?
- (b) The Sam-Victor Pruning Service has the contract for pruning P pine trees in Mammoth. How long will it take them to prune all the trees?
- (c) If Sam and Victor split the pruning contract based on how many trees they each trim, how will they split the Flagstaff contract, which is \$ 2000?

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7. June, Keah, and Leonardo are professional painters. June can paint a typical-sized room in 80 minutes. Keah can paint a typical-sized room in 100 minutes, and Leonardo can paint a typical-sized room in 120 minutes. They get a job to paint 3 typical-sized rooms.
- (a) How long will it take the three of them working together to do the 3-room job?
- (b) June and Keah are insistent that Leonardo must improve his speed so that in the future, they can do a 3-room job in 90 minutes. How fast must Leo be able to complete a room in order for the team to complete 3 rooms in 90 minutes?
8. A cyclist takes the same route each day for 5 days. She records her average speed each day in her exercise log: 18 mi/hr, 23 mi/hr, 21 mi/hr, 14 mi/hr, 18 mi/hr.
- (a) What is her average speed overall for the 5 trips? Report your answer to 2 decimal places.
- (b) What would her average speed have to be on day 6 for her overall average speed for all 6 trips to be 20 mi/hr? Report your answer to 2 decimal places.